

No. 676,963.

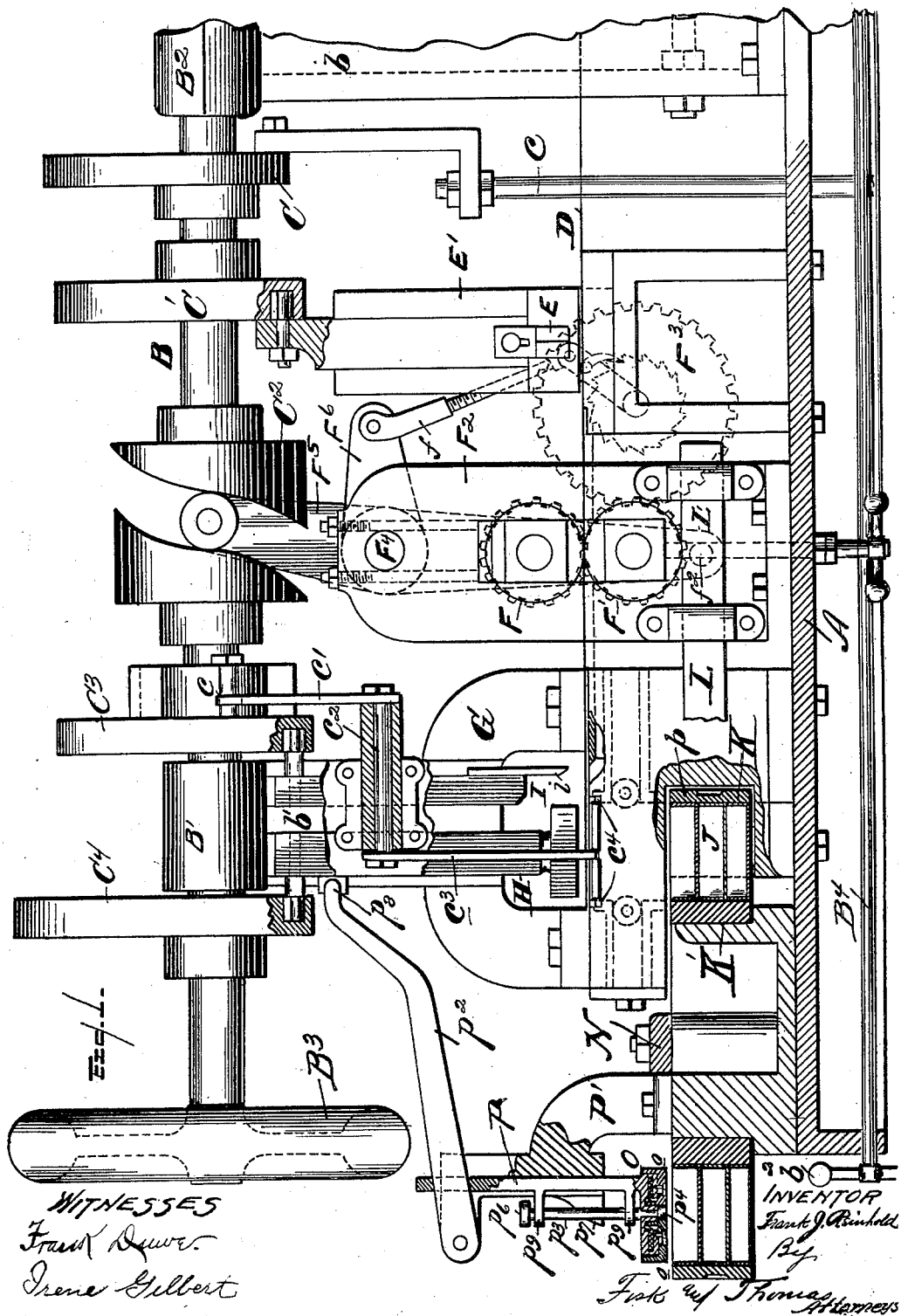
Patented June 25, 1901.

F. J. REINHOLD.
METHOD OF MAKING PAPER BOXES.

(Application filed July 25, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 2.

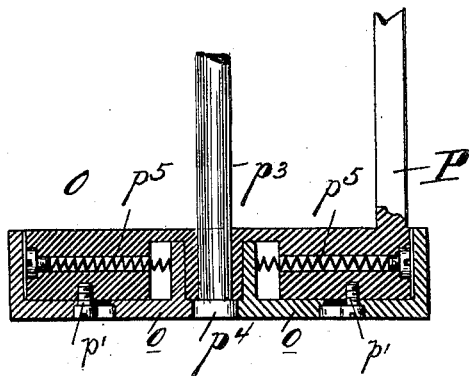
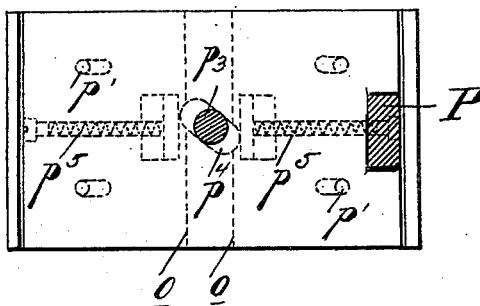


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANK J. REINHOLD, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO
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METHOD OF MAKING PAPER BOXES.

SPECIFICATION forming part of Letters Patent No. 676,963, dated June 25, 1901.

Original application filed December 21, 1899, Serial No. 741,146. Divided and this application filed July 25, 1900. Serial No. 24,749. (No specimens.)

To all whom it may concern:

Be it known that I, FRANK J. REINHOLD, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Methods of Making Paper Boxes; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in the method of manufacturing paper boxes, and relates more particularly to the means for drying the glued surfaces of the boxes and the means for causing the glue to hold the surfaces together more effectually.

This application is the division of an application filed by me December 21, 1899, Serial No. 741,146, in which said application both the machines and method were originally claimed. For the purpose, therefore, of describing and disclosing my invention I file herewith copies of a part of the drawings, and I use herein the description employed in the aforesaid application. Said drawings are as follows:

Figure 1 is a side elevation of a machine for making paper boxes, partly in section. Figs. 2 and 3 are views showing details of the re-pressing device.

In the drawings, A represents the table or bed of the machine, which may be supported upon any suitable standards.

B is the main shaft of the machine, mounted in bearings B' and B², the shaft being parallel with the table. The bearing B² is supported from the table on the vertical support b, and the bearing B' is supported on the vertical support b'. The main shaft B is driven by any suitable means and is provided with the hand-wheel B³ at the front of the machine to provide means for turning the shaft by hand in adjusting the machine.

B⁴ is a rod extending through underneath

the bed and is provided at the front of the machine with a small hand-wheel b². This shaft operates the clutch mechanism at the rear of the machine, whereby the operator from in front can start or stop the same at will.

The machine is provided with the usual means for feeding paper or cardboard, for scoring it, for gluing it, and for cutting it off. The glue mechanism is underneath the machine and is not shown, except the cam C and the connecting-rod c. The paper travels on the line D and is first operated upon in the machine by the slitting device E, operating from cam C'. This device cuts two parallel slits in the paper at the point where it is to be cut off and in such a manner that the slits will extend an equal distance into each blank, leaving between the slits what is known as the "end flaps" and outside of the slits the side flaps. The slitting device moves up and down in the machine in guides formed in the standard E'.

The feeding device consists of the feeding-rolls F and F', mounted in the vertical standard F². These rolls are geared together and are driven from the gear F³, mounted in the standard E'.

F⁴ is a transverse rock-shaft mounted in the standards F² and is rocked by means of the arm F⁵ and the cam C².

F⁶ is a horizontal arm attached to the rock-shaft F⁴, the free end of which is caused to move up and down as the shaft is operated by the cam C².

f is a connecting-rod operated by the arm F⁶. The reciprocating movement of this connecting-rod is communicated to the driving gear-wheel F³ through a ratchet mechanism in the usual manner, whereby the feeding-rolls are given the necessary intermittent movement for feeding the paper.

G is a supporting-frame that is bolted to the bed and that rises to a sufficient height to form the support for the bearing B' and to serve as the guide for the former-plunger H as well as the plunger I, bearing the knife i

for cutting off blanks. The plunger I is operated by the cam C³ and the former-plunger H is operated by the cam C⁴. The means for cutting off the blank and for forming the box from the blank are quite similar to those employed heretofore in the art.

The cardboard is fed under the former-plunger by the operation of the feeding-rolls, and through the action of the cams the former-plunger and the knife move downward until the knife severs the blank from the sheet, after which the continued movement of the former-plunger forces the blank downward into a female die, folding up the side of the box, leaving the end flap extending in a horizontal direction and the side flaps standing in a vertical direction. As is common in this class of machines, the former-plunger rests a moment while the folding-fingers c⁴ move in to fold in the side flaps. These fingers are operated from the cam c through the rock-arm c', the rock-shaft c², and the arm c³. After the side flaps are folded in the former-plunger continues its movement down into the female die, folding the end flaps up against the side flaps and plunger and then carrying the whole box downward into a pocket J, formed in a horizontal carrying-wheel K. This wheel is provided with a series of these pockets, preferably about ten in number, and the wheel itself is mounted on the hollow hub K'. The wheel proper is formed of one casting, the outer ends of the pockets being closed by the plates p. As the former-plunger forces one box into the pocket it forces the box already in the pocket downward to a lower position, and after the pockets are filled with boxes the entry of a new box in the top of the pocket discharges a completed box from the bottom.

L is a bar arranged to reciprocate along the side of the machine and is operated by the arm L', fixed to the shaft f². On the bar L is pivoted a dog, (not shown,) which engages with the periphery of the wheel K as the bar is operated to move the wheel forward a sufficient distance to bring another pocket under the plunger. To the outer end of the bar L is pivoted a second dog M', which engages with the wheel to lock it when it is at the point of rest and during the time the former-plunger is forcing a box into one of the pockets of the wheel.

N is a friction-plate arranged to be drawn down on the hub to increase the resistance to its movement.

O is a re-pressing device arranged to enter the pocket in the wheel that is directly opposite the one under the former-plunger. The purpose of this re-pressing device is to force the glued surfaces of the box a second time into close contact and at the time when the glue is partly set or beginning to set. The means I employ for accomplishing this result consist in an expanding plunger, consisting of the opposite sections o o, the

two sections being held in operative relations on and by the pins p' p'' and being normally drawn toward each other by the spring p⁵ p⁶. This expanding plunger is fixed to the plunger-rod P, and the rod is arranged to move up and down in a way formed in the standard P'. The plunger-rod and plunger are moved up and down simultaneously with the former-plunger by the lever p², the end of the lever being engaged with the former-plunger by a universal joint p⁸. Extending out from the plunger-rod P are supports p² p³, in which is mounted a vertical cam-rod p³, provided with the cam p⁴ at its lower end, located between the sections of the expanding plunger. The cam-rod p³ is provided with an arm p⁶, which travels along the surface of a cam p⁷, fixed to the standard p', the construction being such that the cam-rod p³ is given a part of a turn as it travels down, the rotation of the rod causing the cam p⁴ to force the opposite sections of the plunger O apart and against the glued sections of the box.

One of the objects of my invention is to reduce the size of the carrying or drying wheel and still have the boxes when delivered from the wheel perfectly glued. This result I accomplish by the use of a re-pressing device arranged to force the glued surfaces together after the glue has had time to partially dry and by the use of my plan for entering and discharging the boxes from the wheel, which consists in entering one box in each pocket until each pocket contains a box and then entering a second box in each pocket on top of the first box. The two features may be united in the same machine or they may be used independently with proportional advantage. Thus the re-pressing device may be used where but one box is carried in a pocket at a time, or the entering of the boxes in the pockets in the series, as described, may be used without the re-pressing device.

I will have it understood that while I have shown a horizontal wheel in combination with the forming and re-pressing devices arranged to carry more than one series of boxes the same combination may be made using an upright wheel or any other form of traveling pockets. My invention thus does not consist alone in the machine, but in the method of using any machine adapted to the purposes of my improved method.

Having thus described my invention, what I claim is—

1. The within-described method of forming and gluing boxes, consisting of forming and entering a single box into each one of a series of pockets until all of the pockets are occupied, and then entering a second box into each of the pockets on top of and against the box before entered in the pocket, whereby the dried box in the pocket is moved down by the entry of the green box, substantially as described.

2. The within-described method of uniting
the glued surfaces of the boxes consisting of
first forming and entering the box in one of
a series of pockets, and then moving the se-
ries of pockets forward one or more points,
5 and then re-pressing the boxes in the pock-
ets, substantially as described.

In testimony whereof I sign this specifica-
tion in the presence of two witnesses.

FRANK J. REINHOLD.

Witnesses:

S. E. THOMAS,
FRANK DEVOE.